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Unrestricted Upon Removal of Attachment 1**

10 CFR 50.90  
10 CFR 2.390

March 20, 2017

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555-0001

Peach Bottom Atomic Power Stations, Units 2 and 3  
Renewed Facility Operating License Nos. DPR-44 and DPR-56  
NRC Docket Nos. 50-277 and 50-278

**Subject:** Request for License Amendment Regarding Measurement Uncertainty  
Recapture Power Uprate - Supplement 1 - Request for Non-Proprietary  
Version of Cameron Corporation Proprietary Documents

**Reference:** 1. Exelon letter to the NRC, "Request for License Amendment Regarding  
Measurement Uncertainty Recapture Power Uprate," dated February 17,  
2017 (ADAMS Accession No. ML17048A444)

In accordance with 10 CFR 50.90, "Application for amendment of license or construction permit," and 10 CFR 50, Appendix K, "ECCS Evaluation Models," Exelon Generation Company, LLC (EGC) requested an amendment to Renewed Facility Operating License Nos. DPR-44 and DPR-56 for Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3, respectively (Reference 1). Specifically, the proposed changes revise the Operating License and Technical Specifications (TS) to implement an increase of 65 megawatts thermal (MWt) (approximately 1.66%) in rated thermal power (RTP) from the current licensed thermal power (CLTP) of 3951 MWt to 4016 MWt.

This letter provides a response to an NRC verbal request to provide a non-proprietary version of the Cameron Uncertainty Analyses for PBAPS Units 2 and 3 that was provided as Attachment 8 in the original amendment request letter (Reference 1). Attachment 1 to this letter provides a replacement to Attachment 8 of Reference 1 that is a proprietary version of the Cameron Uncertainty Analyses for PBAPS Units 2 and 3 with proprietary markers included in Revision 5 to the analyses. There are no technical changes to these analyses. As requested in a verbal request from the NRC, a non-proprietary version of Attachment 1 is provided in Attachment 2. Portions of the information provided in Attachment 1 are considered to be proprietary by Cameron Corporation and are, therefore, exempt from public disclosure pursuant to 10 CFR 2.390. Attachment 3 contains affidavits for withholding information executed by Cameron Corporation. On behalf of Cameron Corporation, EGC requests Attachment 1 be withheld from public disclosure in accordance with 10 CFR 2.390(b)(1).

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U.S. Nuclear Regulatory Commission  
License Amendment Request  
Measurement Uncertainty Recapture – Supplement 1  
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Page 2

There are no regulatory commitments contained in this letter.

Should you have any questions concerning this response, please contact Mr. David Neff at (610) 765-5631.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 20th day of March 2017.

Respectfully,



David P. Helker  
Manager - Licensing & Regulatory Affairs  
Exelon Generation Company, LLC

Attachments:

1. Cameron ER-464, "Uncertainty Analysis for Thermal Power Determination at Peach Bottom Unit 2 Using the LEFM CheckPlus System," Revision 5 (Proprietary Version), and ER-463, "Uncertainty Analysis for Thermal Power Determination at Peach Bottom Unit 3 Using the LEFM CheckPlus System," Revision 5 (Proprietary Version)
2. Cameron ER-464, "Uncertainty Analysis for Thermal Power Determination at Peach Bottom Unit 2 Using the LEFM CheckPlus System," Revision 5 (Non-Proprietary Version), and ER-463, "Uncertainty Analysis for Thermal Power Determination at Peach Bottom Unit 3 Using the LEFM CheckPlus System," Revision 5 (Non-Proprietary Version)
3. Cameron Affidavits Supporting Withholding Attachment 1 from Public Disclosure

cc: USNRC Region I, Regional Administrator  
USNRC Senior Resident Inspector, PBAPS  
USNRC Project Manager, PBAPS  
R. R. Janati, Pennsylvania Bureau of Radiation Protection  
S. T. Gray, State of Maryland

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**ATTACHMENT 2**

**Peach Bottom Atomic Power Station Units 2 and 3**

**Renewed Facility Operating License Nos. 50-277 and 50-278**

**Cameron ER-464, "Uncertainty Analysis for Thermal Power Determination at Peach Bottom Unit 2 Using the LEM CheckPlus System," Revision 5 (Non-Proprietary Version), and ER-463, "Uncertainty Analysis for Thermal Power Determination at Peach Bottom Unit 3 Using the LEM CheckPlus System," Revision 5 (Non-Proprietary Version)**

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Caldon<sup>®</sup> Ultrasonics

Engineering Report: ER-464 Revision 5

**UNCERTAINTY ANALYSIS FOR THERMAL  
POWER DETERMINATION AT PEACH BOTTOM  
UNIT 2 USING THE LEFM<sup>✓</sup>+ SYSTEM**

Prepared by: Joanna Phillips

Reviewed by: Ryan Hannas

Reviewed for Proprietary Information by: Ernie Hauser

February 2017

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Engineering Report No. ER-464, Rev 5  
February 2017

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**Engineering Report: ER-464 Revision 5**

**UNCERTAINTY ANALYSIS FOR THERMAL POWER DETERMINATION  
AT PEACH BOTTOM UNIT 2 USING THE LEFM $\checkmark$ + SYSTEM**

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Uncertainty**

**A.4 [ ]**

**A.5 [ ]**

**B Total Thermal Power Uncertainty using the LEFM $\checkmark$ + System**

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## 1.0 INTRODUCTION

The LEFM $\checkmark$  and LEFM $\checkmark$ +<sup>1</sup> are advanced ultrasonic systems that accurately measure the volume flow and temperature of feedwater in nuclear power plants. Using a feedwater pressure signal input to the LEFM $\checkmark$  and LEFM $\checkmark$ + mass flow is determined. The mass flow and temperature outputs are used, along with other plant data, to compute reactor core thermal power. The technology underlying the LEFM $\checkmark$  ultrasonic instruments and the factors affecting their performance are described in a topical report, Reference 1, and a supplement to this topical report, Reference 2. The LEFM $\checkmark$ +, which contains two LEFM $\checkmark$ 's, is described in another supplement to the topical report, Reference 3. The exact amount of the uprate allowable under a revision to 10CFR50 Appendix K depends not only on the accuracy of the LEFM $\checkmark$ + outputs but also on the uncertainties in other inputs to the thermal power calculation.

It is the purpose of this document to provide an analysis of the uncertainty contribution of the LEFM $\checkmark$ + System [ ] to the overall thermal power uncertainty at Peach Bottom Unit 2 (Appendix B).

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The uncertainties in mass flow and feedwater temperature are also used in the calculation of the thermal power uncertainty due to the LEFM $\checkmark$ + (Appendix B). This appendix provides the amount of the uprate that the plant will be able to recognize. [ ]

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[ ] A detailed discussion of the methodology for combining these terms is described in Reference 3.

This analysis is a bounding analysis for Peach Bottom Unit 2. [ ] The uncertainties in these values are bounded by this analysis.

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### 3.0 APPROACH

All errors and biases are calculated and combined according to the procedures defined in Reference 4 and Reference 5 in order to determine the 95% confidence and probability value. The approach to determine the uncertainty, consistent with determining set points, is to combine the random and bias terms by the means of the RSS approach provided that all the terms are independent, zero-centered and normally distributed.

Reference 4 defines the contributions of individual error elements through the use of sensitivity coefficients defined as follows:

A calculated variable P is determined by algorithm f, from measured variables X, Y, and Z.

$$P = f(X, Y, Z)$$

The error, or uncertainty in P, dP, is given by:

$$dP = \left. \frac{\partial f}{\partial X} \right|_{YZ} dX + \left. \frac{\partial f}{\partial Y} \right|_{XZ} dY + \left. \frac{\partial f}{\partial Z} \right|_{XY} dZ$$

As noted above, P is the determined variable--in this case, reactor power or mass flow-- which is calculated via measured variables X, Y, and Z using an algorithm f(X, Y, Z). The uncertainty or error in P, dP, is determined on a per unit basis as follows:

$$\frac{dP}{P} = \left\{ \left. \frac{X \partial f}{P \partial X} \right|_{YZ} \right\} \frac{dX}{X} + \left\{ \left. \frac{Y \partial f}{P \partial Y} \right|_{XZ} \right\} \frac{dY}{Y} + \left\{ \left. \frac{Z \partial f}{P \partial Z} \right|_{XY} \right\} \frac{dZ}{Z}$$

where the terms in brackets are referred to as the sensitivity coefficients.

If the errors or biases in individual elements ( $dX/X$ ,  $dY/Y$ , and  $dZ/Z$  in the above equation) are all caused by a common (systematic) boundary condition (for example ambient temperature) the total error  $dP/P$  is found by summing the three terms in the above equation. If, as is more often the case, the errors in X, Y, and Z are independent of each other, then Reference 4 and 5 recommends and probability theory requires that the total uncertainty be determined by the root sum square as follows (for 95% confidence and probability):

$$\frac{dP}{P} = \sqrt{\left[ \left( \left\{ \left. \frac{X \partial f}{P \partial X} \right|_{YZ} \right\} \frac{dX}{X} \right)^2 + \left( \left\{ \left. \frac{Y \partial f}{P \partial Y} \right|_{XZ} \right\} \frac{dY}{Y} \right)^2 + \left( \left\{ \left. \frac{Z \partial f}{P \partial Z} \right|_{XY} \right\} \frac{dZ}{Z} \right)^2 \right]}$$

Obviously, if some errors in individual elements are caused by a combination of boundary conditions, some independent and some related (i.e., systematic) then a combination of the two procedures is appropriate.

## 4.0 OVERVIEW

The analyses that support the calculation of LEFM $\checkmark$ + uncertainties are contained in the appendices to this document. The functions of each appendix are outlined below.

### Appendix A.1, LEFM $\checkmark$ + Inputs

This appendix tabulates dimensional and other inputs to the LEFM $\checkmark$ + which is used for the computation of mass flow and temperature. [

] are used in this appendix.

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### Appendix A.2, LEFM $\checkmark$ + Uncertainty Calculations

This appendix calculates the uncertainties in mass flow and temperature as computed by the LEFM $\checkmark$ + using the methodology described in Appendix E of Reference 1 and Appendix A of Reference 3<sup>3</sup>, with uncertainties in the elements of these measurements bounded as described in both references<sup>4</sup>. The spreadsheet calculation draws on the data of Appendix A.1 for dimensional information. [

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This appendix utilizes the results of the calibration testing for the plant spool piece(s) for the uncertainty in the profile factor (calibration coefficient). The engineering reports for the spool piece calibration tests are referenced in Appendix A.3 to this report.

### Appendix A.3, Meter Factor and Meter Factor Uncertainty

The calibration test report for the spool piece(s) establishes the overall uncertainty in the meter (profile) factor of the LEFM $\checkmark$ +. The elements of the meter factor uncertainty include [

elements in establishing the uncertainty in meter factor.

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<sup>3</sup> Reference 3 (ER 157P) develops the uncertainties for the LEFM 3+ system. Because this system uses two measurement planes, the structure of its uncertainties differs somewhat that of an LEFM3.

<sup>4</sup> Reference 3 (ER 157P) revised some of the time measurement uncertainty bounds. The revised bounds are a conservative projection of actual performance of the LEFM hardware. ER 80P used bounds that were based on a conservative projection of theoretical performance.

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**Appendix B, Total Thermal Power Uncertainty using the LEFM<sup>✓+</sup>**

The total thermal power uncertainty for a plant using the LEFM<sup>✓+</sup> system is calculated in this appendix. It combines the results provided in Appendix A, along with plant specific terms (ex., steam enthalpy, moisture carryover, etc.). These terms have been combined in a method consistent with that described in the Topical Report and its supplements (References 1, 2, and 3). Appendix B also reconciles the results of this analysis with ER157(P-A) Rev. 8 (Reference 3).

## 5.0 REFERENCES

- 1) Cameron Topical Report ER-80P, "Improving Thermal Power Accuracy and Plant Safety While Increasing Operating Power Level Using the LEFM Check System", dated March 1997, Revision 0
- 2) Cameron Engineering Report ER-160P, "Supplement to Topical Report ER 80P: Basis for a Power Uprate with the LEFM System", dated May 2000, Revision 0
- 3) Cameron Engineering Report ER-157(P-A), "Supplement to Caldon Topical Report ER-80P: Basis for Power Uprates with an LEFM Check or an LEFM CheckPlus", dated May 2008, Revision 8
- 4) ASME PTC 19.1, Measurement Uncertainty
- 5) Caldon Engineering Report ER-590, "The Effects of Random and Coherent Noise on LEFM CheckPlus Systems", Rev. 2

Appendix A

Appendix A.1, LEFM✓+ Inputs

Appendix A.2, LEFM✓+ Uncertainty Calculations

Appendix A.3, LEFM✓+ Spool Piece(s) Meter Factor and Meter Factor Uncertainty

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**Appendix A.1**

**LEFM<sup>✓</sup>+ Inputs**

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## Appendix A.2

### LEFM<sup>✓</sup>+ Uncertainty Calculations

**No attachment to follow as Appendix is Proprietary in its Entirety**

## Appendix A.3

### LEFM $\checkmark$ + Spool Piece(s) Profile Factor and Profile Factor Uncertainty

Reference Caldon Engineering Reports

ER-441 Rev 1, "Profile Factor Calculation and Accuracy Assessment for the Peach Bottom Unit 2 Replacement LEFM $\checkmark$  + Spool Pieces", August 2016

**Appendix A.4**

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**Appendix A.5**

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## Appendix B

Total Thermal Power Uncertainty using the LEFM $\checkmark$ + System

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Engineering Report: ER-463 Revision 5

**UNCERTAINTY ANALYSIS FOR THERMAL  
POWER DETERMINATION AT PEACH BOTTOM  
UNIT 3 USING THE LEFM<sup>✓</sup>+ SYSTEM**

Prepared by: Joanna Phillips

Reviewed by: Ryan Hannas

Reviewed for Proprietary Information by: Ernie Hauser

February 2017

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**Engineering Report: ER-463 Revision 5**

**UNCERTAINTY ANALYSIS FOR THERMAL POWER DETERMINATION  
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    - A.5 [ ]**
  
  - B Total Thermal Power Uncertainty using the LEFM $\checkmark$ + System**

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## 1.0 INTRODUCTION

The LEFM $\checkmark$  and LEFM $\checkmark$ +<sup>1</sup> are advanced ultrasonic systems that accurately measure the volume flow and temperature of feedwater in nuclear power plants. Using a feedwater pressure signal input to the LEFM $\checkmark$  and LEFM $\checkmark$ + mass flow is determined. The mass flow and temperature outputs are used, along with other plant data, to compute reactor core thermal power. The technology underlying the LEFM $\checkmark$  ultrasonic instruments and the factors affecting their performance are described in a topical report, Reference 1, and a supplement to this topical report, Reference 2. The LEFM $\checkmark$ +, which contains two LEFM $\checkmark$ 's, is described in another supplement to the topical report, Reference 3. The exact amount of the uprate allowable under a revision to 10CFR50 Appendix K depends not only on the accuracy of the LEFM $\checkmark$ + outputs but also on the uncertainties in other inputs to the thermal power calculation.

It is the purpose of this document to provide an analysis of the uncertainty contribution of the LEFM $\checkmark$ + System [ ] to the overall thermal power uncertainty at Peach Bottom Unit 3 (Appendix B).

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The uncertainties in mass flow and feedwater temperature are also used in the calculation of the thermal power uncertainty due to the LEFM $\checkmark$ + (Appendix B). This appendix provides the amount of the uprate that the plant will be able to recognize. [ ]

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[ ] A detailed discussion of the methodology for combining these terms is described in Reference 3.

This analysis is a bounding analysis for Peach Bottom Unit 3. [ ] The uncertainties in these values are bounded by this analysis.

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### 3.0 APPROACH

All errors and biases are calculated and combined according to the procedures defined in Reference 4 and Reference 5 in order to determine the 95% confidence and probability value. The approach to determine the uncertainty, consistent with determining set points, is to combine the random and bias terms by the means of the RSS approach provided that all the terms are independent, zero-centered and normally distributed.

Reference 4 defines the contributions of individual error elements through the use of sensitivity coefficients defined as follows:

A calculated variable P is determined by algorithm f, from measured variables X, Y, and Z.

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The error, or uncertainty in P, dP, is given by:

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where the terms in brackets are referred to as the sensitivity coefficients.

If the errors or biases in individual elements ( $dX/X$ ,  $dY/Y$ , and  $dZ/Z$  in the above equation) are all caused by a common (systematic) boundary condition (for example ambient temperature) the total error  $dP/P$  is found by summing the three terms in the above equation. If, as is more often the case, the errors in X, Y, and Z are independent of each other, then Reference 4 and 5 recommends and probability theory requires that the total uncertainty be determined by the root sum square as follows (for 95% confidence and probability):

$$\frac{dP}{P} = \sqrt{\left[ \left( \left\{ \left. \frac{X \partial f}{P \partial X} \right|_{YZ} \right\} \frac{dX}{X} \right)^2 + \left( \left\{ \left. \frac{Y \partial f}{P \partial Y} \right|_{XZ} \right\} \frac{dY}{Y} \right)^2 + \left( \left\{ \left. \frac{Z \partial f}{P \partial Z} \right|_{XY} \right\} \frac{dZ}{Z} \right)^2 \right]}$$

Obviously, if some errors in individual elements are caused by a combination of boundary conditions, some independent and some related (i.e., systematic) then a combination of the two procedures is appropriate.

## 4.0 OVERVIEW

The analyses that support the calculation of LEFM $\checkmark$ + uncertainties are contained in the appendices to this document. The functions of each appendix are outlined below.

### Appendix A.1, LEFM $\checkmark$ + Inputs

This appendix tabulates dimensional and other inputs to the LEFM $\checkmark$ + which is used for the computation of mass flow and temperature. [

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### Appendix A.2, LEFM $\checkmark$ + Uncertainty Calculations

This appendix calculates the uncertainties in mass flow and temperature as computed by the LEFM $\checkmark$ + using the methodology described in Appendix E of Reference 1, and Appendix A of Reference 3<sup>3</sup>, with uncertainties in the elements of these measurements bounded as described in both references<sup>4</sup>. The spreadsheet calculation draws on the data of Appendix A.1 for dimensional information. [

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This appendix utilizes the results of the calibration testing for the plant spool piece(s) for the uncertainty in the profile factor (calibration coefficient). The engineering reports for the spool piece calibration tests are referenced in Appendix A.3 to this report.

### Appendix A.3, Meter Factor and Meter Factor Uncertainty

The calibration test report for the spool piece(s) establishes the overall uncertainty in the meter (profile) factor of the LEFM $\checkmark$ +. The elements of the meter factor uncertainty include [

] are also elements in establishing the uncertainty in meter factor.

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<sup>3</sup> Reference 3 (ER 157P) develops the uncertainties for the LEFM 3+ system. Because this system uses two measurement planes, the structure of its uncertainties differs somewhat that of an LEFM3.

<sup>4</sup> Reference 3 (ER 157P) revised some of the time measurement uncertainty bounds. The revised bounds are a conservative projection of actual performance of the LEFM hardware. ER 80P used bounds that were based on a conservative projection of theoretical performance.

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**Appendix B, Total Thermal Power Uncertainty using the LEFM ✓+**

The total thermal power uncertainty for a plant using the LEFM<sup>✓+</sup> system is calculated in this appendix. It combines the results provided in Appendix A, along with plant specific terms (ex., steam enthalpy, moisture carryover, etc.). These terms have been combined in a method consistent with that described in the Topical Report and its supplements (References 1, 2, and 3). Appendix B also reconciles the results of this analysis with ER157(P-A) Rev. 8 (Reference 3).

## 5.0 REFERENCES

- 1) Cameron Topical Report ER-80P, "Improving Thermal Power Accuracy and Plant Safety While Increasing Operating Power Level Using the LEFM Check System", dated March 1997, Revision 0
- 2) Cameron Engineering Report ER-160P, "Supplement to Topical Report ER 80P: Basis for a Power Uprate with the LEFM System", dated May 2000, Revision 0
- 3) Cameron Engineering Report ER-157(P-A), "Supplement to Caldon Topical Report ER-80P: Basis for Power Uprates with an LEFM Check or an LEFM CheckPlus", dated May 2008, Revision 8
- 4) ASME PTC 19.1, Measurement Uncertainty
- 5) Caldon Engineering Report ER-590, "The Effects of Random and Coherent Noise on LEFM CheckPlus Systems", Rev. 2

**Appendix A****Appendix A.1, LEFM✓+ Inputs****Appendix A.2, LEFM✓+ Uncertainty Calculations****Appendix A.3, LEFM✓+ Spool Piece(s) Meter Factor and Meter Factor Uncertainty****Appendix A.4, [ ]****Appendix A.5, [ ]**Trade  
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## Appendix A.1

### LEFM<sup>✓</sup>+ Inputs

No Attachment to follow as Appendix is Proprietary in its Entirety

## Appendix A.2

### LEFM $\checkmark$ + Uncertainty Calculations

No Attachment to follow as Appendix is Proprietary in its Entirety

## Appendix A.3

### LEFM $\checkmark$ + Spool Piece(s) Profile Factor and Profile Factor Uncertainty

Reference Caldon Engineering Reports

ER-375 Rev 1, "Profile Factor Calculation and Accuracy Assessment for the Peach Bottom Unit 3 Replacement LEFM $\checkmark$  + Spool Pieces", August 2016

**Appendix A.4**

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**Appendix A.5**

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## Appendix B

### Total Thermal Power Uncertainty using the LEFM<sup>✓</sup>+ System

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*EWK*

**ATTACHMENT 3**

**Peach Bottom Atomic Power Station Units 2 and 3**

**Renewed Facility Operating License Nos. 50-277 and 50-278**

**Cameron Affidavits Supporting Withholding Attachment 1 from Public Disclosure**

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March 13, 2017  
CAW 17-04

Document Control Desk  
U. S. Nuclear Regulatory Commission  
Washington, DC 20555

**APPLICATION FOR WITHHOLDING PROPRIETARY  
INFORMATION FROM PUBLIC DISCLOSURE**

Subject: Cameron Engineering Report ER-464 Rev. 5 "Uncertainty Analysis for Thermal Power Determination at Peach Bottom Unit 2 Using the LEFM + System"

Gentlemen:

This application for withholding is submitted by Cameron (Holding) Corporation, a Nevada Corporation (herein called "Cameron") on behalf of its operating unit, Caldon Ultrasonics Technology Center, pursuant to the provisions of paragraph (b)(1) of Section 2.390 of the Commission's regulations. It contains trade secrets and/or commercial information proprietary to Cameron and customarily held in confidence.

The proprietary information for which withholding is being requested is identified in the subject submittal. In conformance with 10 CFR Section 2.390, Affidavit CAW 17-04 accompanies this application for withholding setting forth the basis on which the identified proprietary information may be withheld from public disclosure.

Accordingly, it is respectfully requested that the subject information, which is proprietary to Cameron, be withheld from public disclosure in accordance with 10 CFR Section 2.390 of the Commission's regulations.

Correspondence with respect to this application for withholding or the accompanying affidavit should reference CAW 17-04 and should be addressed to the undersigned.

Very truly yours,

A handwritten signature in blue ink, appearing to read 'Ernest M. Hauser', with a long horizontal flourish extending to the right.

Ernest M. Hauser  
Director of Business Development  
Nuclear and Defense Markets

Enclosures (Only upon separation of the enclosed confidential material should this letter and affidavit be released.)

March 13, 2017  
CAW 17-04

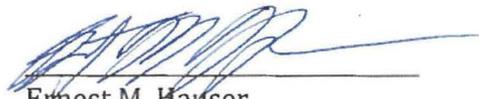
AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA:

SS

COUNTY OF ALLEGHENY:

Before me, the undersigned authority, personally appeared Ernest M. Hauser, who, being by me duly sworn according to law, deposes and says that he is authorized to execute this Affidavit on behalf of Cameron Holding Corporation, a Nevada Corporation (herein called "Cameron") on behalf of its operating unit, Caldon Ultrasonics Technology Center, and that the averments of fact set forth in this Affidavit are true and correct to the best of his knowledge, information, and belief:

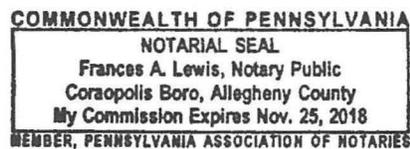
  
Ernest M. Hauser  
Director of Business Development  
Nuclear and Defense Markets

Sworn to and subscribed before me

this 13 day of

March, 2017

Frances A. Lewis  
Notary Public



1. I am the Director of Business Development for Nuclear and Defense Markets of Caldon Ultrasonics Technology Center, and as such, I have been specifically delegated the function of reviewing the proprietary information sought to be withheld from public disclosure in connection with nuclear power plant licensing and rulemaking proceedings, and am authorized to apply for its withholding on behalf of Cameron.
2. I am making this Affidavit in conformance with the provisions of 10 CFR Section 2.390 of the Commission's regulations and in conjunction with the Cameron application for withholding accompanying this Affidavit.
3. I have personal knowledge of the criteria and procedures utilized by Cameron in designating information as a trade secret, privileged or as confidential commercial or financial information.
4. Cameron requests that the information identified in paragraph 5(v) below be withheld from the public on the following bases:

Trade secrets and commercial information obtained from a person and privileged or confidential

The material and information provided herewith is so designated by Cameron, in accordance with those criteria and procedures, for the reasons set forth below.

5. Pursuant to the provisions of paragraph (b) (4) of Section 2.390 of the Commission's regulations, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure should be withheld.
  - (i) The information sought to be withheld from public disclosure is owned and has been held in confidence by Cameron.
  - (ii) The information is of a type customarily held in confidence by Cameron and not customarily disclosed to the public. Cameron has a rational basis for determining the

types of information customarily held in confidence by it and, in that connection utilizes a system to determine when and whether to hold certain types of information in confidence. The application of that system and the substance of that system constitutes Cameron policy and provides the rational basis required. Furthermore, the information is submitted voluntarily and need not rely on the evaluation of any rational basis.

Under that system, information is held in confidence if it falls in one or more of several types, the release of which might result in the loss of an existing or potential advantage, as follows:

- (a) The information reveals the distinguishing aspects of a process (or component, structure, tool, method, etc.) where prevention of its use by any of Cameron's competitors without license from Cameron constitutes a competitive economic advantage over other companies.
- (b) It consists of supporting data, including test data, relative to a process (or component, structure, tool, method, etc.), the application of which data secures a competitive economic advantage, e.g., by optimization or improved marketability.
- (c) Its use by a competitor would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, and assurance of quality, or licensing a similar product.
- (d) It reveals cost or price information, production capacities, budget levels, or commercial strategies of Cameron, its customer or suppliers.
- (e) It reveals aspects of past, present or future Cameron or customer funded development plans and programs of potential customer value to Cameron.
- (f) It contains patentable ideas, for which patent protection may be desirable.

The information sought to be withheld is considered to be proprietary for the reasons set forth in paragraphs (a), (b) and (c), above.

There are sound policy reasons behind the Cameron system, which include the following:

- (a) The use of such information by Cameron gives Cameron a competitive advantage over its competitors. It is, therefore, withheld from disclosure to protect the Cameron competitive position.
  - (b) It is information that is marketable in many ways. The extent to which such information is available to competitors diminishes the Cameron ability to sell products or services involving the use of the information.
  - (c) Use by our competitor would put Cameron at a competitive disadvantage by reducing his expenditure of resources at our expense.
  - (d) Each component of proprietary information pertinent to a particular competitive advantage is potentially as valuable as the total competitive advantage. If competitors acquire components of proprietary information, any one component may be the key to the entire puzzle, thereby depriving Cameron of a competitive advantage.
  - (e) Unrestricted disclosure would jeopardize the position of prominence of Cameron in the world market, and thereby give a market advantage to the competition of those countries.
  - (f) The Cameron capacity to invest corporate assets in research and development depends upon the success in obtaining and maintaining a competitive advantage.
- (iii) The information is being transmitted to the Commission in confidence, and, under the provisions of 10 CFR §§ 2. 390, it is to be received in confidence by the Commission.

- (iv) The information sought to be protected is not available in public sources or available information has not been previously employed in the same manner or method to the best of our knowledge and belief.
- (v) The proprietary information sought to be withheld is the submittal titled:  
Cameron Engineering Report ER- 464 Rev. 5 “Uncertainty Analysis for Thermal Power Determination at Peach Bottom Unit 2 Using the LEFM ✓ + System”
- Table of Contents page ii contains partial proprietary information
  - Pages 1, 2, 4, 5 contain partial proprietary information
  - Appendix A Table of Contents contains partial proprietary information
  - Appendices A.1, A.2, A.4, A.5, and B are proprietary in their entirety

It is designated therein in accordance with 10 CFR §§ 2.390(b)(1)(i)(A,B), with the reason(s) for confidential treatment noted in the submittal and further described in this affidavit. This information is voluntarily submitted for use by the NRC Staff in their review of the accuracy assessment of the proposed methodology for the LEFM CheckPlus System used by Peach Bottom Atomic Power Station for flow measurement at the licensed reactor thermal power level of 4016 MWt.

Public disclosure of this proprietary information is likely to cause substantial harm to the competitive position of Cameron because it would enhance the ability of competitors to provide similar flow and temperature measurement systems and licensing defense services for commercial power reactors without commensurate expenses. Also, public disclosure of the information would enable others to use the information to meet NRC requirements for licensing documentation without the right to use the information.

The development of the technology described in part by the information is the result of applying the results of many years of experience in an intensive Cameron effort and the expenditure of a considerable sum of money.

In order for competitors of Cameron to duplicate this information, similar products would have to be developed, similar technical programs would have to be performed, and a significant manpower effort, having the requisite talent and experience, would have to be expended for developing analytical methods and receiving NRC approval for those methods.

Further the deponent sayeth not.

Caldon Ultrasonics Technology Center

1000 McClaren Woods Drive  
Coraopolis, PA 15108  
Tel +1 724-273-9300  
Fax +1 724-273-9301



March 13, 2017  
CAW 17-03

Document Control Desk  
U. S. Nuclear Regulatory Commission  
Washington, DC 20555

**APPLICATION FOR WITHHOLDING PROPRIETARY  
INFORMATION FROM PUBLIC DISCLOSURE**

Subject: Cameron Engineering Report ER-463 Rev. 5 "Uncertainty Analysis For Thermal Power Determination at Peach Bottom Unit 3 Using the LEFM + System"

Gentlemen:

This application for withholding is submitted by Cameron (Holding) Corporation, a Nevada Corporation (herein called "Cameron") on behalf of its operating unit, Caldon Ultrasonics Technology Center, pursuant to the provisions of paragraph (b)(1) of Section 2.390 of the Commission's regulations. It contains trade secrets and/or commercial information proprietary to Cameron and customarily held in confidence.

The proprietary information for which withholding is being requested is identified in the subject submittal. In conformance with 10 CFR Section 2.390, Affidavit CAW 17-03 accompanies this application for withholding setting forth the basis on which the identified proprietary information may be withheld from public disclosure.

Accordingly, it is respectfully requested that the subject information, which is proprietary to Cameron, be withheld from public disclosure in accordance with 10 CFR Section 2.390 of the Commission's regulations.

Correspondence with respect to this application for withholding or the accompanying affidavit should reference CAW 17-03 and should be addressed to the undersigned.

Very truly yours,

A handwritten signature in blue ink, appearing to read "Ernest M. Hauser", is written over a horizontal line.

Ernest M. Hauser  
Director of Business Development  
Nuclear and Defense Markets

Enclosures (Only upon separation of the enclosed confidential material should this letter and affidavit be released.)

AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA:

SS

COUNTY OF ALLEGHENY:

Before me, the undersigned authority, personally appeared Ernest M. Hauser, who, being by me duly sworn according to law, deposes and says that he is authorized to execute this Affidavit on behalf of Cameron (Holding) Corporation, a Nevada Corporation (herein called "Cameron") on behalf of its operating unit, Caldon Ultrasonics Technology Center, and that the averments of fact set forth in this Affidavit are true and correct to the best of his knowledge, information, and belief:

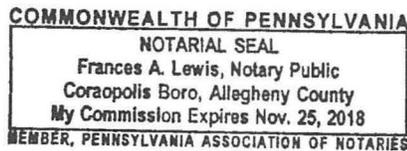
  
Ernest M. Hauser  
Director of Business Development  
Nuclear and Defense Markets

Sworn to and subscribed before me

this 13 day of

March, 2017

Frances A. Lewis  
Notary Public



1. I am the Director of Business Development for Nuclear and Defense Markets of Caldon Ultrasonics Technology Center, and as such, I have been specifically delegated the function of reviewing the proprietary information sought to be withheld from public disclosure in connection with nuclear power plant licensing and rulemaking proceedings, and am authorized to apply for its withholding on behalf of Cameron.
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Trade secrets and commercial information obtained from a person and privileged or confidential

The material and information provided herewith is so designated by Cameron, in accordance with those criteria and procedures, for the reasons set forth below.

5. Pursuant to the provisions of paragraph (b) (4) of Section 2.390 of the Commission's regulations, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure should be withheld.
  - (i) The information sought to be withheld from public disclosure is owned and has been held in confidence by Cameron.
  - (ii) The information is of a type customarily held in confidence by Cameron and not customarily disclosed to the public. Cameron has a rational basis for determining the

types of information customarily held in confidence by it and, in that connection utilizes a system to determine when and whether to hold certain types of information in confidence. The application of that system and the substance of that system constitutes Cameron policy and provides the rational basis required. Furthermore, the information is submitted voluntarily and need not rely on the evaluation of any rational basis.

Under that system, information is held in confidence if it falls in one or more of several types, the release of which might result in the loss of an existing or potential advantage, as follows:

- (a) The information reveals the distinguishing aspects of a process (or component, structure, tool, method, etc.) where prevention of its use by any of Cameron's competitors without license from Cameron constitutes a competitive economic advantage over other companies.
- (b) It consists of supporting data, including test data, relative to a process (or component, structure, tool, method, etc.), the application of which data secures a competitive economic advantage, e.g., by optimization or improved marketability.
- (c) Its use by a competitor would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, and assurance of quality, or licensing a similar product.
- (d) It reveals cost or price information, production capacities, budget levels, or commercial strategies of Cameron, its customer or suppliers.
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  - (e) Unrestricted disclosure would jeopardize the position of prominence of Cameron in the world market, and thereby give a market advantage to the competition of those countries.
  - (f) The Cameron capacity to invest corporate assets in research and development depends upon the success in obtaining and maintaining a competitive advantage.
- (iii) The information is being transmitted to the Commission in confidence, and, under the provisions of 10 CFR §§ 2. 390, it is to be received in confidence by the Commission.

(iv) The information sought to be protected is not available in public sources or available information has not been previously employed in the same manner or method to the best of our knowledge and belief.

(v) The proprietary information sought to be withheld is the submittal titled:

Engineering Report ER-463 Rev. 5 "Uncertainty Analysis for Thermal Power Determination at Peach Bottom Unit 3 Using the LEFM ✓ + System"

- Table of Contents page ii contains partial proprietary information
- Pages 1, 2, 4, 5 contain partial proprietary information
- Appendix A Table of Contents contains partial proprietary information
- Appendices A.1, A.2, A.4, A.5, and B are proprietary in their entirety

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Public disclosure of this proprietary information is likely to cause substantial harm to the competitive position of Cameron because it would enhance the ability of competitors to provide similar flow and temperature measurement systems and licensing defense services for commercial power reactors without commensurate expenses. Also, public disclosure of the information would enable others to use the information to meet NRC requirements for licensing documentation without the right to use the information.

The development of the technology described in part by the information is the result of applying the results of many years of experience in an intensive Cameron effort and the expenditure of a considerable sum of money.

In order for competitors of Cameron to duplicate this information, similar products would have to be developed, similar technical programs would have to be performed, and a significant manpower effort, having the requisite talent and experience, would have to be expended for developing analytical methods and receiving NRC approval for those methods.

Further the deponent sayeth not.